

## COPY FOR IB

## PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

To:

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REC'D 12 NOV 2004

PCT

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WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing  
(day/month/year) 03 NOVEMBER 2004 (03.11.2004)

Applicant's or agent's file reference NANO-FILAMEN		FOR FURTHER ACTION See paragraph 2 below	
International application No. <b>PCT/KR2004/000188</b>	International filing date (day/month/year) <b>02 FEBRUARY 2004 (02.02.2004)</b>	Priority date(day/month/year)	
International Patent Classification (IPC) or both national classification and IPC <b>IPC7 D01F 9/00</b>			
Applicant <b>KIM, Hak-Yong et al</b>			

## 1. This opinion contains indications relating to the following items:

- Box No. I Basis of the opinion
- Box No. II Priority
- Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- Box No. IV Lack of unity of invention
- Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- Box No. VI Certain documents cited
- Box No. VII Certain defects in the international application
- Box No. VIII Certain observations on the international application

## 2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.  
For further options, see Form PCT/ISA/220.

## 3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/KR  Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer OH, SANG KYUN Telephone No. 82-42-481-8165
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**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/KR2004/000188

**Box No. I Basis of this opinion**

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

- a sequence listing  
 table(s) related to the sequence listing

b. format of material

- in written format  
 in computer readable form

c. time of filing/furnishing

- contained in the international application as filed.  
 filed together with the international application in computer readable form.  
 furnished subsequently to this Authority for the purposes of search.

3.  In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/KR2004/000188

**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Claims	1-14	YES
	Claims		NO
Inventive step (IS)	Claims	1-14	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-14	YES
	Claims		NO

**2. Citations and explanations :**

Reference is made to the following documents identified in the International Search Report (ISR):

D1 : US 4657793 A (14 April 1987)

D2 : US 6110590 A (29 August 2000)

The claimed invention relates to a method for making a continuous filament consisting of nanofibers, wherein polymer spinning liquid is electrostatically spun to a collector through nozzles to obtain a nanofiber web of ribbon form, then the nanofiber web is passed through an air twister and twisted to obtain a nanofiber filament of continuous filament form, and then the nanofiber filament is drawn.

D1 discloses an integral fibrous structure built up by a continuous filament forming process where fibers are attracted to a surface by electrostatic potential.

D2 discloses a silk nanofiber composite network produced by forming a solution of silk fiber and hexafluoroisopropanol and electrospinning the solution, thereby forming a non-woven network of nanofibers having a diameter in the range from about 2 to about 2000 nanometers.

The feature of the present invention, such as twisting of nanofiber web to obtain a nanofiber filament of continuous filament form, is not disclosed in D1 and D2. Therefore, the subject matter of claims 1 to 14 is novel pursuant to PCT Article 33(2).

The subject matter of claims 1 to 14 is considered to involve an inventive step pursuant to PCT Article 33(3), since it refers to an improved process, such as a method for making a continuous filament consisting of nanofibers by a simple and continuous process, which is not known or even suggested in the prior art, particularly in D1 and D2.

Claims 1 to 14 also meet the criteria set out in PCT Article 33(4), because all the claims are considered to be industrially applicable.